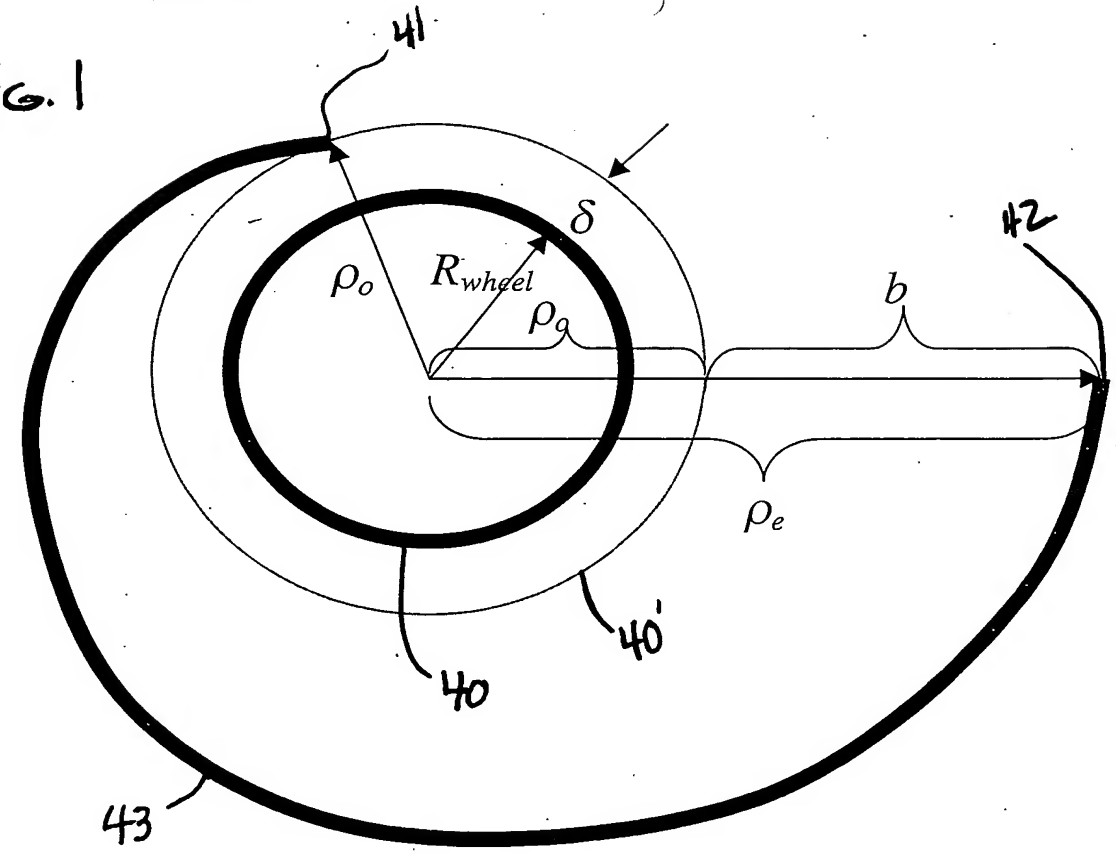
FIG. 1



Diffusing angle, α

FIG. 2

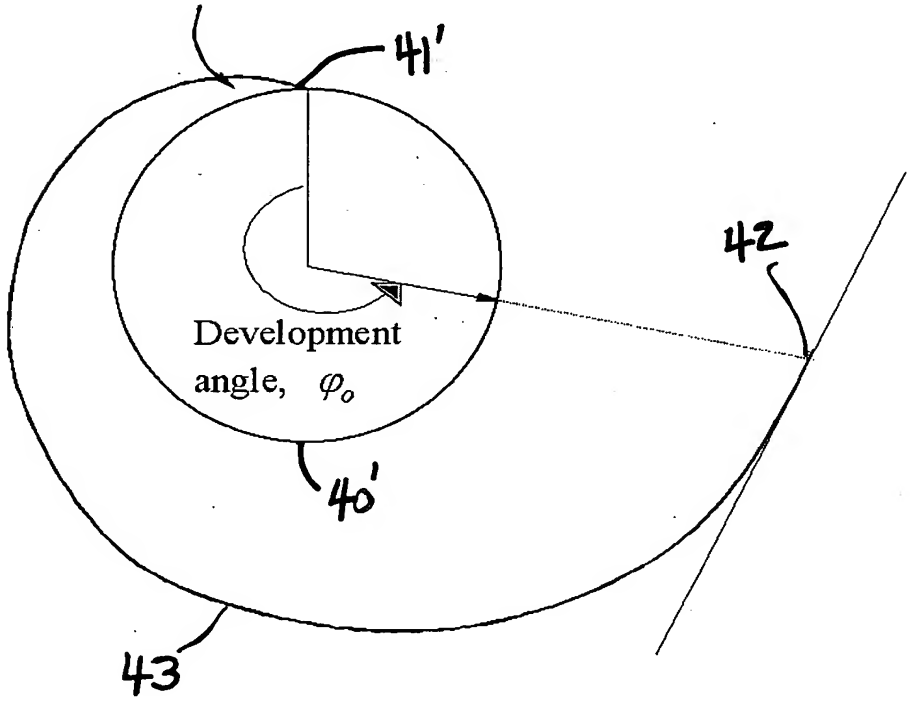


FIG. 3

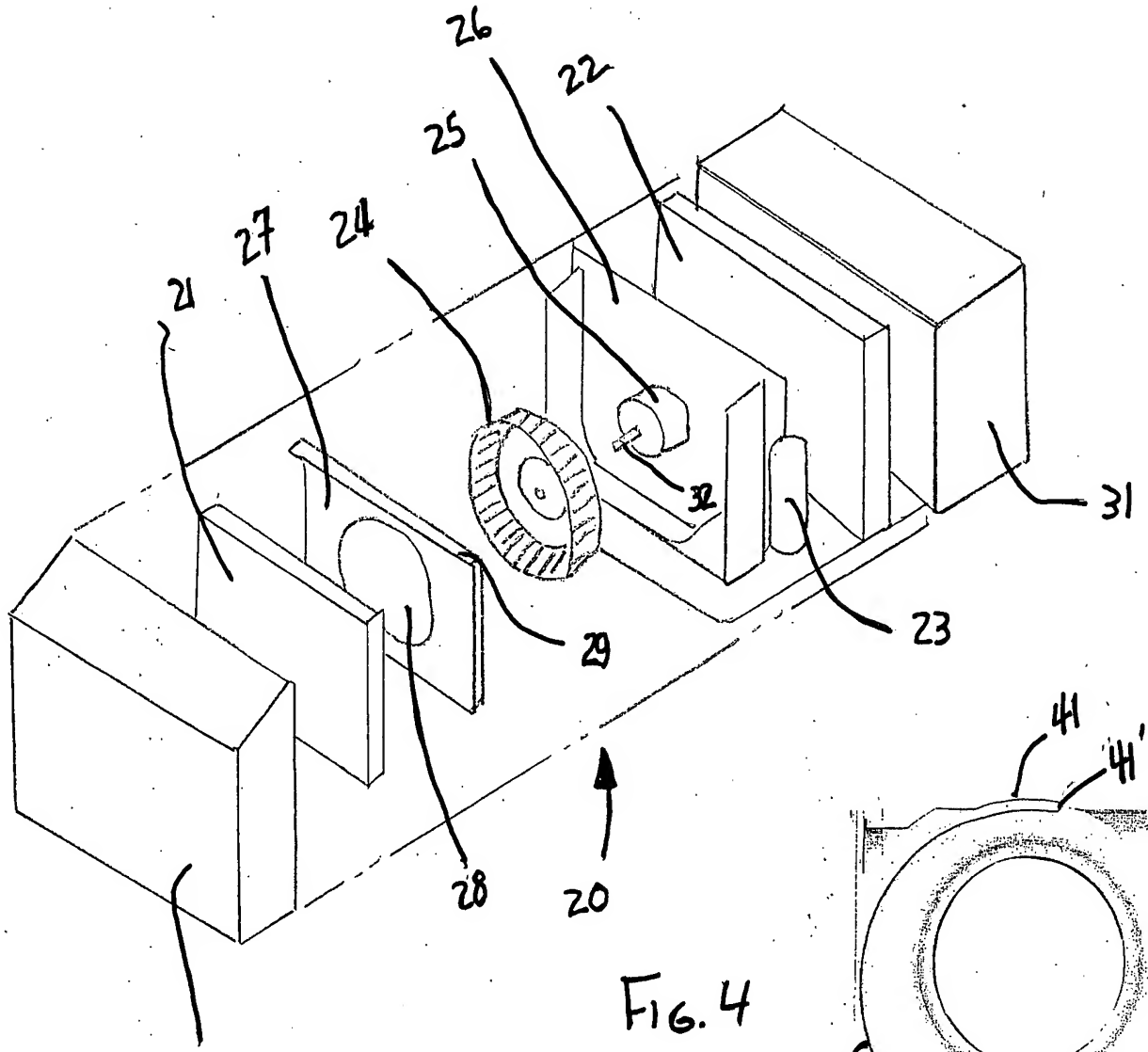


FIG. 1A

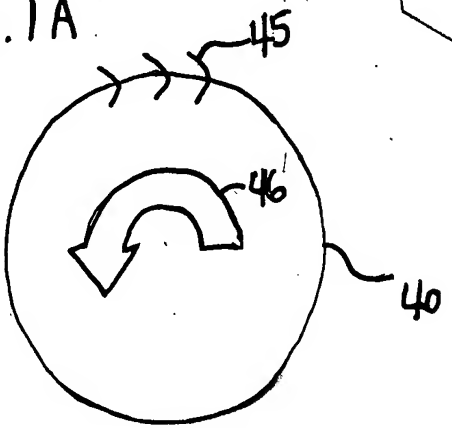


FIG. 4

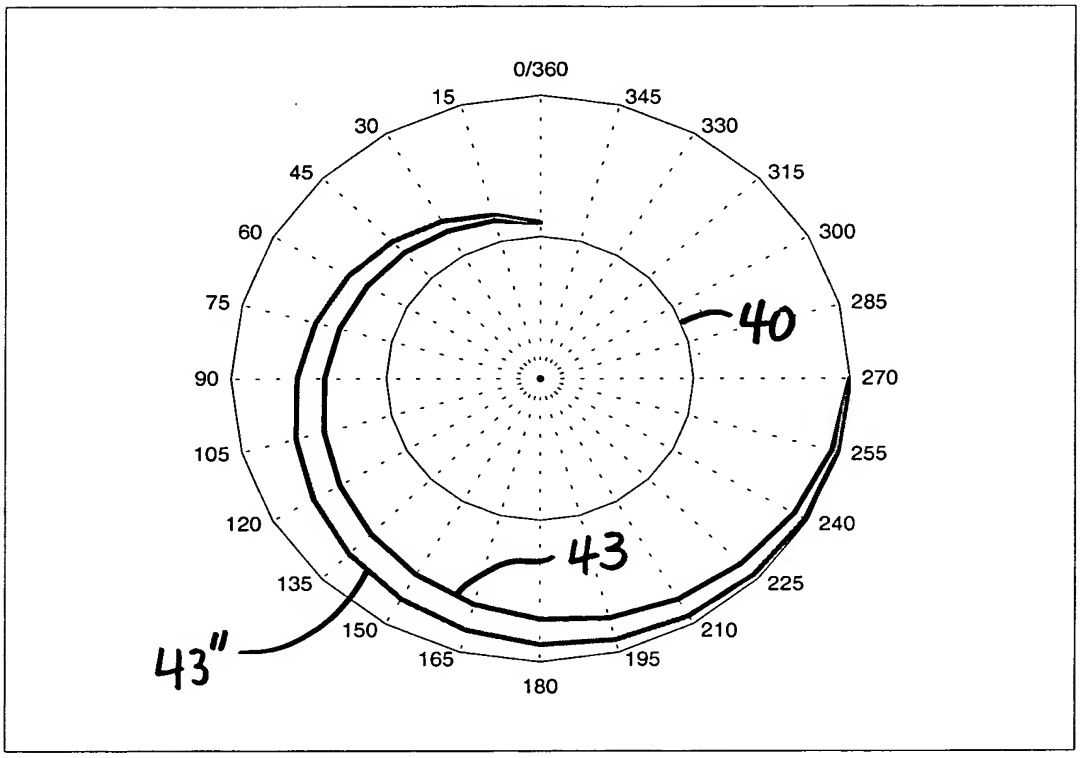

0/360
15
30
45
60
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
40
43
43"

FIG. 4A

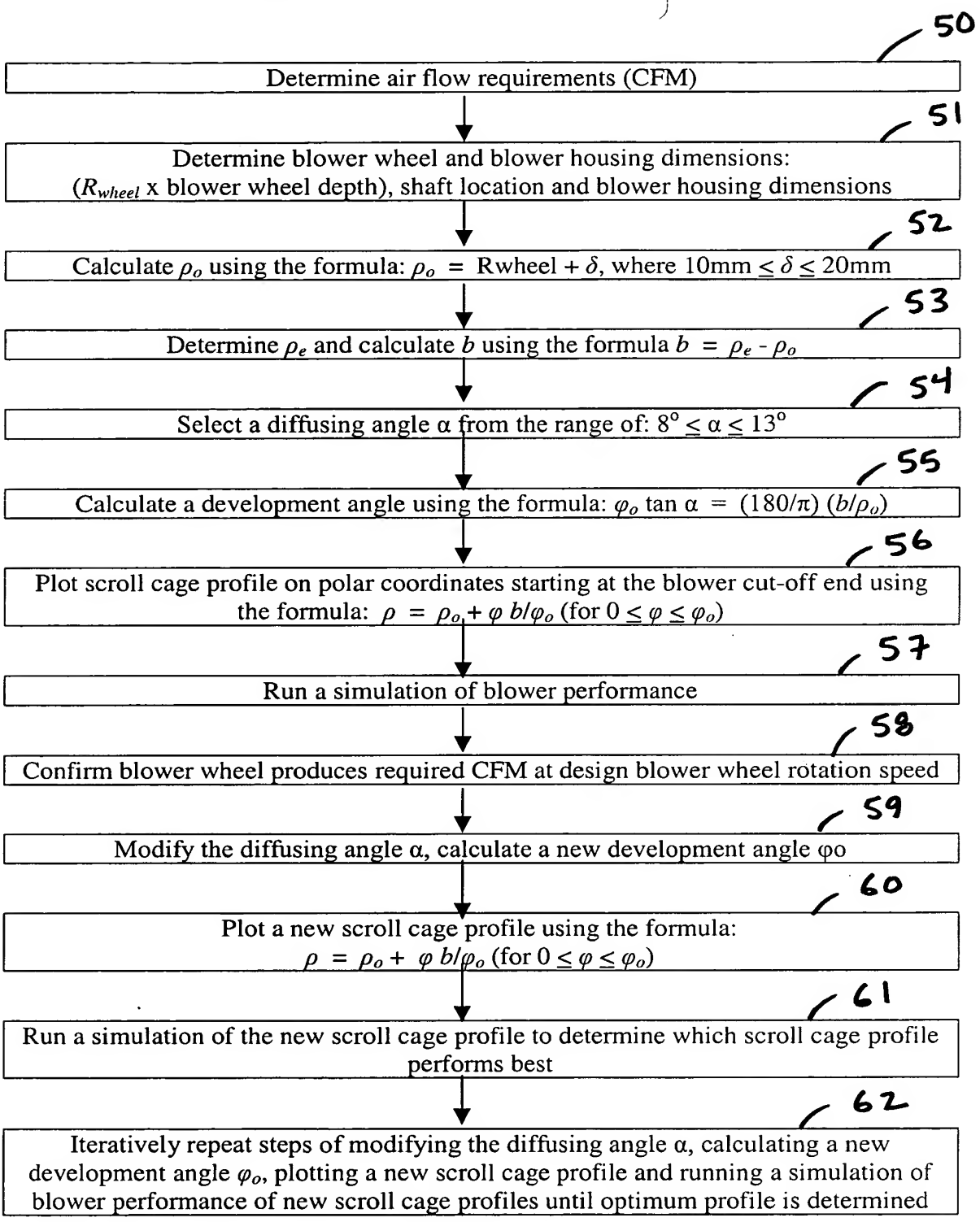

50
Determine air flow requirements (CFM)
51
Determine blower wheel and blower housing dimensions: (R_{wheel} x blower wheel depth), shaft location and blower housing dimensions
52
Calculate ρ_o using the formula: ρ_o = Rwheel + δ, where 10mm $\leq \delta \leq$ 20mm
53
Determine ρ_e and calculate b using the formula $b = \rho_e - \rho_o$
54
Select a diffusing angle α from the range of: $8^\circ \leq \alpha \leq 13^\circ$
55
Calculate a development angle using the formula: $\varphi_o \tan \alpha = (180/\pi)\ (b/\rho_o)$
56
Plot scroll cage profile on polar coordinates starting at the blower cut-off end using the formula: $\rho = \rho_o + \varphi\ b/\varphi_o$ (for $0 \leq \varphi \leq \varphi_o$)
57
Run a simulation of blower performance
58
Confirm blower wheel produces required CFM at design blower wheel rotation speed
59
Modify the diffusing angle α, calculate a new development angle φo
60
Plot a new scroll cage profile using the formula: $\rho = \rho_o + \varphi\ b/\varphi_o$ (for $0 \leq \varphi \leq \varphi_o$)
61
Run a simulation of the new scroll cage profile to determine which scroll cage profile performs best
62
Iteratively repeat steps of modifying the diffusing angle α, calculating a new development angle φ_o, plotting a new scroll cage profile and running a simulation of blower performance of new scroll cage profiles until optimum profile is determined

FIG. 5

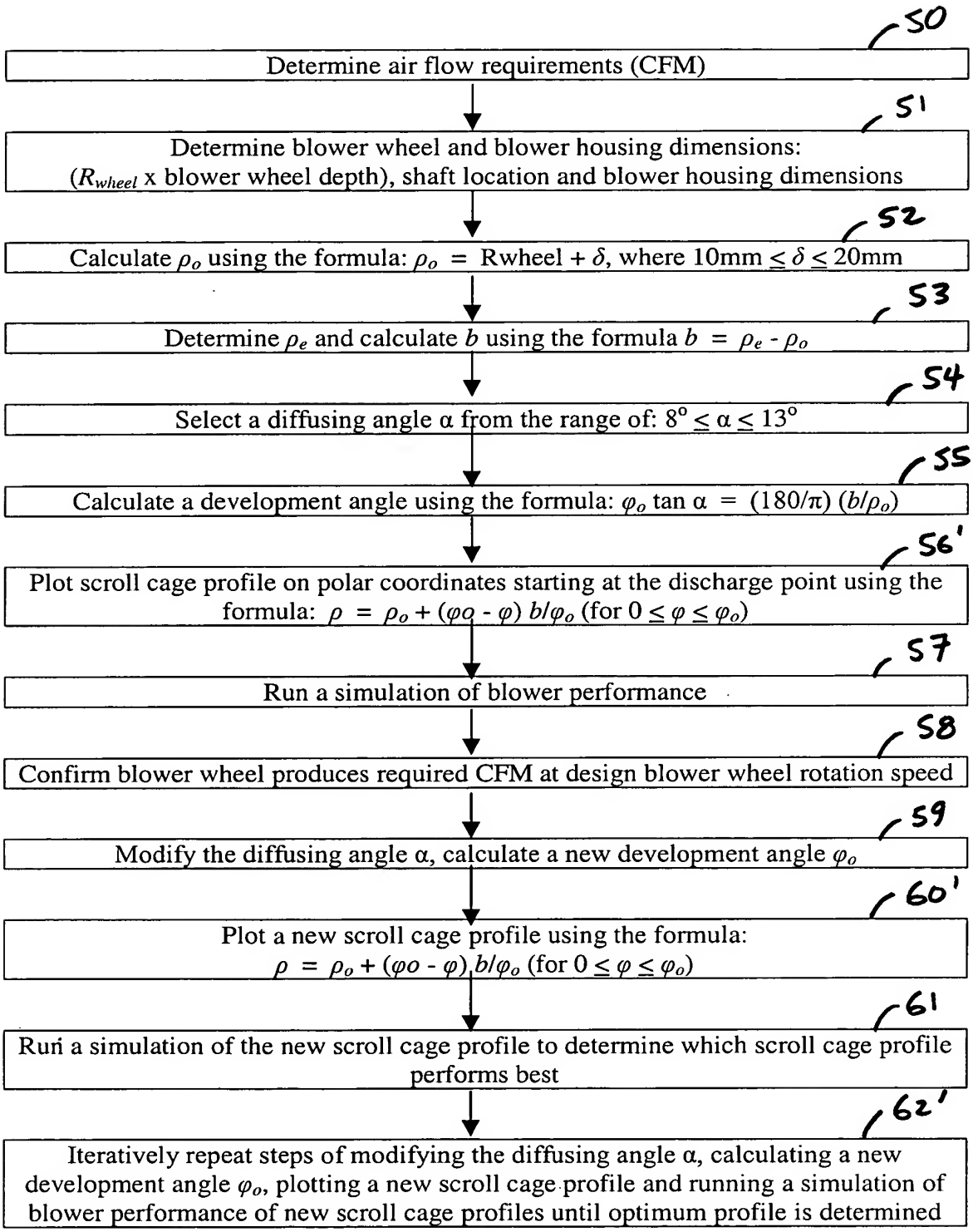

50
Determine air flow requirements (CFM)
51
Determine blower wheel and blower housing dimensions: (R_{wheel} x blower wheel depth), shaft location and blower housing dimensions
52
Calculate ρ_o using the formula: ρ_o = Rwheel + δ, where 10mm $\leq \delta \leq$ 20mm
53
Determine ρ_e and calculate b using the formula $b = \rho_e - \rho_o$
54
Select a diffusing angle α from the range of: $8^\circ \leq \alpha \leq 13^\circ$
55
Calculate a development angle using the formula: $\varphi_o \tan \alpha = (180/\pi)(b/\rho_o)$
56'
Plot scroll cage profile on polar coordinates starting at the discharge point using the formula: $\rho = \rho_o + (\varphi o - \varphi)\, b/\varphi_o$ (for $0 \leq \varphi \leq \varphi_o$)
57
Run a simulation of blower performance
58
Confirm blower wheel produces required CFM at design blower wheel rotation speed
59
Modify the diffusing angle α, calculate a new development angle φ_o
60'
Plot a new scroll cage profile using the formula: $\rho = \rho_o + (\varphi o - \varphi)\, b/\varphi_o$ (for $0 \leq \varphi \leq \varphi_o$)
61
Run a simulation of the new scroll cage profile to determine which scroll cage profile performs best
62'
Iteratively repeat steps of modifying the diffusing angle α, calculating a new development angle φ_o, plotting a new scroll cage profile and running a simulation of blower performance of new scroll cage profiles until optimum profile is determined

FIG. 6